

Appendix 3

Job 113: Identification of Priority Species

Appendix 3 A: History of Job 113

Appendix 3 B: Job 113 Ranking Criteria for Endangered and Threatened Species

Appendix 3 C: Job 113 Ranking Criteria for Special Concern Species

Appendix 3 D: Job 113 Ranking Criteria for Game Species

History of Job 113

George J. Matula, Jr.

Job 113 is a Maine Federal Aid Job under Wildlife Resource Assessment W-82-R. Job 113 than was first established in the late 1980s. The Job Objective is, *“To develop and implement an objective selection process to determine which wildlife species, including species officially listed as Threatened or Endangered, will receive management attention in the 5 year planning cycle.”* Primary focus is to be on special concern species and state listed species as reflected in the following Procedures:

1. Develop a procedure and criteria to select priority wildlife species that will receive management attention during the current 5- year planning cycle. Priority species will be those for which information is needed to determine whether a species should be listed under the Maine Endangered Species Act.
2. Coordinate with the other Wildlife Resource Assessment Groups and Management Section on procedures and criteria developed in 1.
3. Identify priority species and use as input to the development and implementation of jobs to study the status and needs of these priority species.
4. Develop a procedure and criteria to prioritize which Endangered and Threatened Species will be scheduled for strategic plans and operational programs.

The first major meeting to address Job 113 was held December 2, 1993. At that meeting, we decided to clarify the goal of Job 113. We decided that the goal was *“To develop an objective process of allocating Wildlife Division resources to achieve the wildlife management mandates of the Department, as defined by current State of Maine laws.”* Meetings were held sporadically through 1995. We tried several iterations of a ranking system that pooled all species together, but ran into difficulty ranking harvested species, E&T species, and special concern species against each other. Also, during this period, the Division was deeply involved in developing a new E&T listing system, which caused us to place Job 113 on the back burner. However, a couple of important issues came out of this effort:

1. We decided to examine the approach Florida used in ranking their species (Millsap et al. 1990), and
2. We developed the following concepts:
 - A. We (IF&W) have an ethical and biological obligation to develop an assessment and management system for all harvested species under our jurisdiction. By so doing, we demonstrate our commitment to monitoring the impact of harvest on these species and document how we will respond to perturbations in the viability of their populations.

- B. Because of the importance of item A., species for which no assessment or management system is in place should initially end up high on any priority list we develop.
- C. Species for which management systems are in place and operational, and which seem to be working well, should be fully funded to keep them operational. The assumption is that management systems are dynamic and subject to constant review. Past experience has shown that most systems have been streamlined and have become more efficient over time. Therefore, management system review should serve to identify those systems that require inordinate commitments of resources, and thus encourage frugality.
- D. Once management systems are in place for all harvested species, the dynamics of the ranking process will continue to prioritize research, resource commitment, etc., based on socioeconomic impact, feasibility, etc.

On October 1, 1998, the Management Team convened to renew efforts on Job 113. During the first couple meetings, we accomplished the following:

1. We agreed that Job 113, as written, is too narrow in scope, and that it should include game species, as well as E&T and special concern species.
2. We reiterated our position that we had a moral and ethical responsibility to include all species that are hunted or trapped, and that ultimately we should produce an assessment and management system (be it ever so short) for each of them.
3. We agreed there were already several coarse filters in place to help us prioritize our efforts including:
 - The Department's *Strategic Plan*,
 - Guidelines For Prioritizing WRAS Activities,
 - The current E&T list,
 - The current special concern list, and
 - The current list of hunted and trapped species.
4. We decided to prioritize species within 4 categories:
 - Game species,
 - E&T species,

- Special concern species, and
 - Other species.
5. We agreed that after species are prioritized within the above categories, that representatives of the Wildlife Division would meet to establish cross-group priorities in light of other priorities as identified in MDIFW's *Strategic Plan*, and the Guidelines For Prioritizing WRAS Activities. From the resulting list of priorities, we would design a work program that can reasonably be accomplished by the staff and available financial resources.
 6. We agreed that part of the Habitat Group's work program would be in support of priorities set for the other groups.

Game species was the first category we tackled. We followed up with a system for Endangered and Threatened species, and finally with a system for species of special concern. All were based on modifications and enhancement for Florida's approach (Millsap et al. 1990).

Literature Cited:

Millsap, B.A., J. A. Gore, D. E. Runde, and S. I. Cerulean. 1990. Setting Priorities for the Conservation of Fish and Wildlife Species in Florida. Wildlife Monographs 111. 57pp.

Job 113 Ranking Criteria for Endangered and Threatened Species

Updated December 27, 2004

Biological Variables and Categories Within Variables**1. Population size**

If species is a vertebrate, use part A

If species is an invertebrate, use part B

A. Breeding population of *vertebrates* is known or suspected to be:

- a. 1 - 50 individuals (10 points)
- b. 50 - 250 individuals (8 points)
- c. 250 - 500 individuals (5 points)
- d. 500 - 1,000 individuals (2 points)
- e. >1,000 individuals (0 points)

B. Breeding population of *invertebrates* is known or suspected to be:

- a. Large or viable population at a single site (10 points)
- b. Large or viable population at 2 - 5 sites (7 points)
- c. Large or viable population at 6 - 10 sites (3 points)
- d. Large or viable population at >10 sites (0 points)

2. Population trend - overall trend in number of individuals (not including natural cycles) throughout Maine within the last 2 decades (or other appropriate time interval considering taxon's generation time). If population trend is unknown, consider trends in the availability and condition of the taxon's habitat as indicative of population trend.

- A. Population size known or suspected to be decreasing (10 points)
- B. Population known or suspected to be stable (5 points)
- C. Population size known or suspected to be increasing (0 points)

3. Range Size - the size of area over which the taxon is distributed during the season when distribution is most restricted.

- A. <100 km² (<1 township) (10 points)
- B. 101-1,000 km² (1 - 10 townships) (8 points)
- C. 1,000 km² (10 townships) up to ¼ the size of Maine (6 points)
- D. About ¼ - ½ the size of Maine (4 points)
- E. About ½ - ¾ the size of Maine (2 point)
- F. Statewide (0 points)

4. **Distribution trend** (in Maine) - % historical change (last 50 years) in area occupied by the taxon (This is an estimate of change in the portion of the total area that is occupied or utilized; it may not equal the change in total range).
 - A. Area occupied has declined by >50% (10 points)
 - B. Area occupied has declined by 26 - 50% (8 points)
 - C. Area occupied has declined by 5 - 25% (5 points)
 - D. Area occupied has declined by <5% (2 Points)
 - E. Area occupied is stable or has increased (0 points)

5. **Population concentration** - degree to which individuals within populations congregate or aggregate at specific sites including seasonally (e.g., breeding sites, migration focal points) or daily (e.g., communal roosts).
 - A. Population concentrates or occurs at a single site (10 points)
 - B. Population concentrates or occurs at 2 - 5 sites (7 points)
 - C. Population concentrates or occurs at 6 - 10 sites (5 points)
 - D. Population concentrates or occurs at 11 - 20 sites (2 points)
 - E. Population occurs at >20 sites or does not concentrate (0 points)

6. **Reproductive potential for recovery** - ability of the taxon to recover from serious declines in population size.
 - A. Average number of eggs or live young produced/adult female/yr.
 - a. <5 offspring/female/yr. (5 points)
 - b. 5 - 9 offspring/female/yr. (2.5 points)
 - c. >9 offspring/female/yr. (0 point)
 - B. Minimum age at which females typically first reproduce.
 - a. >8 yr. (5 points)
 - b. 4-8 yr. (3 points)
 - c. 2-3 yr. (1 point)
 - d. <2 yr. (0 points)

7. **Ecological adaptability** - degree to which the taxon is dependent upon certain environmental factors, i.e. where the bottlenecks are.
 - A. Dietary adaptability - choices below relate to the primary way in which populations (a species or guild within an order or class) respond to decreases in availability of preferred food type.
 - a. Not adaptable (5 points)
 - b. Moderately adaptable (2.5 points)
 - c. Highly adaptable (0 points)

- B. Reproductive adaptability - choices below relate to the primary way in which local populations respond to decreases in availability of preferred breeding or young rearing sites within their habitat (e.g., tree, snag, or host species or size class).
 - a. Not adaptable (5 points)
 - b. Moderately adaptable (2.5 points)
 - c. Highly adaptable (0 points)

- 8. **Predicted trends of habitat to species** - now or within the next 25 years
 - A. Currently declining (well recognized trend) (10 points)
 - B. Likely declining; or stable, but likely to decline (8 points)
 - C. Net habitat gain/loss is expected to be balanced (5 points)
 - D. Likely increasing; or stable, but likely to increase (2 points)
 - E. Currently increasing (well recognized trend) (0 points)

- 9. **Maine's role in species' recovery/conservation**
 - A. Species is endemic or near endemic to Maine. (10 points)
 - B. Extremely important (i.e. >90% of the North American population occurs in Maine) (10 points)
 - C. Very important (i.e. 51 - 90% of the North American population occurs in Maine) (7 points)
 - D. Important (i.e. 5 - 50% of the North American population occurs in Maine) (3 points)
 - E. Little importance (i.e. <5% of the North American population occurs in Maine) (0 points)

- 10. **Position of Maine within species' North American range** (coastline does not constitute edge of range)
 - A. Maine is in core of species range (10 points)
 - B. Maine is at edge of species range, but species is declining throughout range (5 points)
 - C. Maine is at edge of species range, but species is secure elsewhere (0 points)

Current Knowledge Variables and Categories Within Variables

- 1. **Knowledge of distribution in Maine** (survey score)
 - A. Distribution is extrapolated from a few locations, or knowledge limited to general range maps (10 points)
 - B. Broad range limits or habitat associations are known, but township occurrence cannot be predicted accurately (5 points)
 - C. Distribution is well known and occurrence can be accurately predicted throughout the range (0 point)

2. Knowledge of population size in Maine
 - A. Currently unknown (10 points)
 - B. Known locally but not statewide or at all sites (5 points)
 - C. Well known statewide and at most sites (0 points)
3. Knowledge of population trend in Maine
 - A. Not currently monitored (10 points)
 - B. Monitored locally or statewide monitoring inadequate to detect population trend (7 points)
 - C. Statewide monitoring adequate to detect population trend (determined by indices) (3 points)
 - D. Statewide monitoring based on population estimates, or nearly complete censuses (0 points)
4. Knowledge of population size needed to establish recovery goals
 - A. Population demographics unknown, no Population Viability Analysis (PVA) (10 points)
 - B. Some demographic information in scientific literature, but inadequate to develop a simple PVA (7 points)
 - C. Demographic information is adequate to develop a simple PVA (3 points)
 - D. PVA completed and used to establish recovery goals (0 points)
5. Knowledge of major factors responsible for the species' listing (research score)
 - A. Key factors are unknown or unsubstantiated in the scientific literature or Departmental data (10 points)
 - B. Some key factors are known (5 points)
 - C. Key factors are well documented (0 points)
6. Status of species planning and management (management score)
 - A. Status of species *assessment*
 - a. No assessment has been done for species (10 points)
 - b. An assessment has been done but is in need of revision (5 points)
 - c. A current assessment has been completed (0 points)
 - B. Status of species *management system*
 - a. Management system for species has not been completed (10 points)
 - b. Management system has major problems (7 points)
 - c. Management system has minor problems (3 points)
 - d. Management system is working well (0 points)

7. Knowledge of statewide habitat quantification**A. Habitat *quality* trend**

- a. Unknown (5 points)
- b. Some documentation (2.5 points)
- c. Well documented (0 points)

B. Habitat *quantity* trend

- a. Unknown (5points)
- b. Some documentation (2.5 points)
- c. Well documented (0 points)

8. Knowledge of costs to recover species

- A. Costs to recover species are unknown (5 points)
- B. Costs to recover species have been roughly estimated but not documented (2.5 points)
- C. Costs to recover species have been estimated and documented (0 points)

9. Knowledge of public interest and non consumptive use of the species

- A. Unknown or poorly documented (10 points)
- B. Documented elsewhere, but not in Maine (5 points)
- C. Relatively well-documented in Maine (0 points)

Socioeconomic Variables and Categories Within Variables**1. Public interest - positive or negative (Social score)**

- A. Intense statewide interest in species (10 points)
- B. Intense local or moderate statewide interest (7 points)
- C. Local interest only (3 points)
- D. Very little public interest (0 points)

2. Positive or negative impacts that use of species has on the economy (Economic score)

- A. Significant impact on Maine's economy (10 points)
- B. Significant local or moderate statewide impact (7 points)
- C. Local or low statewide impact (3 points)
- D. Little or no impact (0 points)

Potential for Recovery Variables and Categories Within Variables

1. Habitat conservation and species' recovery

A. Importance of *additional* habitat conservation to species recovery

- a. Increased habitat conservation very important to species recovery (5 points)
- b. Increased habitat conservation moderately important to species recovery (2.5 points)
- c. Increased habitat conservation minimally important to species recovery (0 point)

B. Ability to address *additional* habitat conservation needs (consider factors other than cost)

If answer to variable 1A above is "c" then assign 0 points to this variable, otherwise assign points as follows:

- a. Habitat required to meet recovery goals is easy to address (5 points)
- b. Habitat required to meet recovery goals is moderately difficult to address (2.5 points)
- c. Habitat required to meet recovery goals is difficult to address (0 points)

2. Limiting factors other than habitat (e.g. disturbance, predation, pollution - if it affects physiology, etc.)

A. Nature of limiting factors (other than habitat degradation)

- a. Threats are high (5 points)
- b. Threats are moderate (2.5 point)
- c. Threats are minimal. (0 points)

B. Ability to address limiting factors (other than habitat degradation)

If answer to variable 2A above is "c" then assign 0 points to this variable, otherwise assign points as follows:

- a. Limiting factors relatively easy to address (5 points)
- b. Limiting factors moderately difficult to address (2.5 points)
- c. Limiting factors difficult or impossible to address (0 points)

3. Potential for recovery synergy

- A. Management or recovery actions will significantly benefit other Endangered or Threatened wildlife at >75% of the species' occurrences. (10 points)
- B. Management or recovery actions will significantly benefit other Endangered or Threatened wildlife at <75% of species' occurrences. (7 points)
- C. Management or recovery actions will significantly benefit Special Concern wildlife. (3 points)
- D. Management or recovery actions will not benefit other Endangered, Threatened, or Special Concern wildlife. (0 points)

4. Anticipated extent of recovery and post-recovery management (assuming resources are available to fully address recovery needs)

- A. Extent of recovery possible in next 15 years
 - a. Recovery to a viable population in Maine. (10 points)
 - b. Population not viable in Maine but viable in region. (5 points)
 - c. Population not viable in Maine or region (0 points)
 - B. Management required post-recovery (other than routine monitoring)
 - a. Requires little/no post-recovery management. (10 points)
 - b. Requires periodic management to maintain populations or habitat. (5 points)
 - c. Requires constant, intensive, annual management. (0 points)
5. **Total cost of recovery** (cost to MDIFW)
- A. Cost of recovery
 - a. Low (e.g. <\$50,000) (4 points)
 - b. Moderate (e.g. \$50,000 to \$500,000) (2 points)
 - c. Expensive (e.g. \$500,000 to \$1,000,000) (1 points)
 - d. Very expensive (e.g. > \$1,000,000) (0 points)
 - B. Annual Cost of post-recovery management (Current dollar value, factor out inflation; includes monitoring, environmental permit review, and salaries)
 - a. Little or no costs to maintain recovered population (e.g. < \$5,000 annually) (3 points)
 - b. Moderately expensive to maintain recovered population (e.g. \$5,000 - \$50,000 annually) (2 points)
 - c. Expensive to maintain recovered population (e.g. \$50,000 - \$100,000 annually) (1 points)
 - d. Very expensive to maintain recovered population (e.g. >\$100,000 annually) (0 points)
 - C. Cost of delaying recovery actions 10 years (Current dollar value, factor out inflation)
 - a. Recovery costs will more than double if action is not initiated immediately (3 points)
 - b. Recovery costs will increase, but not more than double (1.5 points)
 - c. Recovery costs will be about the same 10 years from now (0 points)

Job 113 Ranking Criteria for Special Concern Species

Updated December 27, 2004

Biological Variables and Categories Within Variables

If the rater does not know how to score a variable, they should select a score based on their best professional judgment.

1. Population size

If species is a non-migratory vertebrate, use part A

If species is a migratory vertebrate, but only breeds in Maine, use part A

If species is a migratory vertebrate, but only stops-over in Maine, use part B

If species is a migratory vertebrate, but regularly breeds and stops-over in Maine, use highest score of A or B

If a species is an invertebrate, or vertebrate for which there is no basis for determining the population, use part C

A. Breeding population of *vertebrates* is known or suspected to be:

- a. 1 - 50 individuals (10 points)
- b. 50 - 250 individuals (8 points)
- c. 250 - 500 individuals (5 points)
- d. 500 - 1,000 individuals (2 points)
- e. >1,000 individuals (0 points)

B. Non-breeding population of *vertebrates* - % of flyway population that stops-over in Maine

- a. >50% (10points)
- b. 26 - 50% (7 points)
- c. 10 - 25% (3 points)
- d. <10% (0 points)

C. Breeding population of *invertebrates* is known or suspected to be:

- a. Population at, or historically known from, a single site (10 points)
- b. Population at, or historically known from, 2 - 5 sites (7 points)
- c. Population at, or historically known from, 6 - 10 sites (3 points)
- d. Population at, or historically known from, >10 sites (0 points)

2. Population trend - overall trend in number of individuals (not including natural cycles) throughout Maine within the last 2 decades (or other appropriate time interval considering taxon's generation time). If population trend is unknown, consider trends in the availability and condition of the taxon's habitat as indicative of population trend.

- C. Population size is suspected to be decreasing (10 points)
- D. Population is suspected to be stable (5 points)
- E. Population is suspected to be increasing (0 points)

3. **Range size** - the size of area over which the taxon is distributed during the season when distribution is most restricted.
 - C. <100 km² (<1 township) (10 points)
 - D. 101-1,000 km² (1 - 10 townships) (8 points)
 - E. >1,000 km² (10 townships) up to ¼ the size of Maine, or coast wide (6 points)
 - F. About ¼ - ½ the size of Maine (4 points)
 - G. About ½ - ¾ the size of Maine (2 points)
 - H. Statewide (0 points)

4. **Distribution trend** (in Maine) - % historical change (last 50 years) in area occupied by the taxon (This is an estimate of change in the portion of the total area that is occupied or utilized; it may not equal the change in total range).
 - C. Area occupied has, or is suspected to have, declined by >50% (10 points)
 - D. Area occupied has, or is suspected to have, declined by 26 - 50% (8 points)
 - E. Area occupied has, or is suspected to have, declined by 5 - 25% (5 points)
 - F. Area occupied has, or is suspected to have, declined by <5% (2 Points)
 - G. Area occupied is stable or has, or is suspected to have, increased (0 points)

5. **Population concentration** - degree to which individuals within populations congregate or aggregate at specific sites including seasonally (e.g., breeding sites, migration focal points) or daily (e.g., communal roosts).
 - C. Population concentrates or occurs at a single site (10 points)
 - D. Population concentrates or occurs at 2- 5 sites (7 points)
 - E. Population concentrates or occurs at 6-10 sites (5 points)
 - F. Population concentrates or occurs at >10 sites (2 points)
 - G. Population does not concentrate (0 points)

6. **Reproductive potential for recovery** - ability of the taxon to recover from serious declines in population size.
 - C. Average number of eggs or live young produced/adult female/yr.
 - a. <5 offspring/female/yr. (5 points)
 - b. 5 - 9 offspring/female/yr. (2.5 points)
 - c. >9 offspring/female/yr. (0 point)
 - B. Minimum age at which females typically first reproduce.
 - a. >8 yr. (5 points)
 - b. 4-8 yr. (3 points)
 - c. 2-3 yr. (1 point)
 - d. <2 yr. (0 points)

7. **Ecological adaptability** - degree to which the taxon is dependent upon certain environmental factors, i.e. where the bottlenecks are.
- A. Dietary adaptability - choices below relate to the primary way in which populations (a species or guild within an order or class) respond to decreases in availability of preferred food type.
 - a. Not adaptable (3.3 points)
 - b. Moderately adaptable (1.7 points)
 - c. Highly adaptable (0 points)
 - B. Reproductive adaptability - choices below relate to the primary way in which local populations respond to decreases in availability of preferred breeding or young rearing sites within their habitat (e.g., tree, snag, or host species or size class).
 - a. Not adaptable (3.3 points)
 - b. Moderately adaptable (1.7 points)
 - c. Highly adaptable (0 points)
 - C. Other forms of adaptability or sensitivity – ecological or behavioral specializations not covered in variables 7A or 7B (e.g., strict requirements for hibernacula, narrow ambient temperature limits, or specific roosting structure, sensitivity to contaminants, etc.).
 - a. Has specialized requirements or is highly sensitive (3.3 points)
 - b. No specialized requirements or is not very sensitive (0 points)
8. **Predicted trends of habitat limiting to species** - now or within the next 25 years
- C. Currently declining (well recognized trend) (10 points)
 - D. Likely declining; or stable, but likely to decline (8 points)
 - E. Net habitat gain/loss is expected to be balanced (5 points)
 - F. Likely increasing; or stable, but likely to increase (2 points)
 - G. Currently increasing (well recognized trend) (0 points)
9. **Maine's role in species' recovery/conservation**
- C. Species is endemic or near endemic to Maine. (10 points)
 - D. Very important (i.e. >50% of the North American population occurs in Maine) (10 points)
 - E. Important (i.e. 5 - 50% of the North American population occurs in Maine) (5 points)
 - F. Little importance (i.e. <5% of the North American population occurs in Maine) (0 points)
10. **Position of Maine within species' North American range** (coastline does not constitute edge of range)
- A. Maine is in core of species range (10 points)
 - B. Maine is at edge of species range, but species is declining throughout range (5 points)
 - C. Maine is at edge of species range, but species is secure elsewhere (0 points)

Current Knowledge Variables and Categories Within Variables

1. **Knowledge of distribution in Maine (survey score)**
 - A. Distribution is extrapolated from a few locations, or knowledge limited to general range maps (10 points)
 - B. Broad range limits or habitat associations are known, but township occurrence cannot be predicted accurately (5 points)
 - C. Distribution is well known and occurrence can be accurately predicted throughout the range (0 points)
2. **Knowledge of population size in Maine**
 - A. Currently unknown (10 points)
 - B. Known locally but not statewide or at all sites (5 points)
 - C. Well known statewide and at most sites (0 points)
3. **Knowledge of population trend in Maine**
 - A. Not currently monitored (10 points)
 - B. Monitored locally or statewide monitoring inadequate to detect population trend (7 points)
 - C. Statewide monitoring adequate to detect population trend (determined by indices) (3 points)
 - D. Statewide monitoring based on population estimates, or nearly complete censuses (0 points)
4. **Knowledge of population limitations (research score)**
 - A. Key factors affecting population size and distribution are unknown or unsubstantiated in the scientific literature or Departmental data (10 points)
 - B. Some key factors affecting population size and distribution are known (5 points)
 - C. Key factors affecting population size and distribution are well documented (0 points)
5. **Knowledge of statewide habitat quantification**
 - A. Habitats important to the species are not known, not measured, or cannot be measured with current technology (10 points)
 - B. Habitats important to the species have been measured at least once in the last 15 years on a statewide basis (5 points)
 - C. Habitats important to the species are measured at regular intervals (at least every 5 years) on a statewide basis; or habitat is not limiting species in Maine (0 points)
6. **Synergy of addressing knowledge needs**
 - A. Surveys or research will also address information needs of >5 additional SC or listed species (10 points)
 - B. Surveys or research will also address information needs of 2 - 5 additional SC or listed species (5 points)

- C. Surveys or research will address information needs of only the target species **(0 points)**
-
- 7. **Survey or research effort (time and money) needed to gather information and make final determination of listing status**
 - A. Relatively little effort or cost needed to obtain critical information; e.g. 1 - 2 yr. study or <\$50K) **(10 points)**
 - B. Moderate effort or cost needed to obtain critical information; e.g. 2 - 5 yr. study or \$50 - 100K **(5 points)**
 - C. High effort or cost needed to obtain critical information; e.g. >5 yr. study or >\$100K **(0 points)**
 - 8. **Knowledge of public interest and non consumptive use of the species**
 - A. Unknown or poorly documented **(10 points)**
 - B. Documented elsewhere, but not in Maine **(5 points)**
 - C. Relatively well-documented in Maine **(0 points)**

Socioeconomic Variables and Categories Within Variables

- 1. **Public interest - positive or negative (Social score)**
 - A. Intense statewide interest in species **(10 points)**
 - B. Intense local or moderate statewide interest **(7 points)**
 - C. Local interest only **(3 points)**
 - D. Very little public interest **(0 points)**
- 2. **Potential positive or negative impacts that species may have on the Maine economy if the species is listed as a state Endangered or Threatened Species (Economic score)**
 - A. Significant impact on Maine's economy **(10 points)**
 - B. Significant local or moderate statewide impact **(7 points)**
 - C. Local or low statewide impact **(3 points)**
 - D. Little or no impact **(0 points)**
- 3. **Current positive or negative impacts the species has on the Maine economy.**
 - A. Significant impact on Maine's economy **(10 points)**
 - B. Significant local or moderate statewide impact **(7 points)**
 - C. Local or low statewide impact **(3 points)**
 - D. Little or no impact **(0 points)**

Job 113 Ranking Criteria for Game Species

Updated December 27, 2004

Biological Variables and Categories Within Variables**1. Population size**

If species is non migratory, use breeding population (part A)

If species is migratory, but only breeds in Maine, use *Breeding population* (part A)

If species is migratory, but only stops-over in Maine, use *Non-breeding population* (part B)

If species is migratory, but regularly breeds and stops-over in Maine, use highest score of A or B

A. Breeding population - the estimated number of breeding adults in Maine

- a. 0-500 individuals (10 points)
- b. 501-1,000 individuals, or population size is unknown but suspected to be small (8 points)
- c. 1,001-3,000 individuals (6 points)
- d. 3,001-10,000 individuals (4 points)
- e. 10,001-50,000 individuals, or size is unknown but suspected to be large (2 points)
- f. >50,000 individuals (0 points)

B. Non breeding population - % of flyway population that stops-over in Maine

- a. >50% (10 points)
- b. 26 - 50% (7 points)
- c. 10 - 25% (3 points)
- d. <10% (0 points)

2. Population trend - overall trend in number of individuals (not including natural cycles) throughout Maine over last 2 decades (or other appropriate time interval considering taxon's generation time). If population trend is unknown, consider trends in the availability and condition of the taxon's habitat as indicative of population trend.

- A. Population size known to be decreasing (10 points)
- B. Trend unknown but population size suspected to be decreasing (8 points)
- C. Population formerly experienced serious declines but is presently stable or increasing (5 points)
- D. Population size known to be increasing (0 points)

3. Range size - the size of area over which the taxon is distributed during the season when distribution is most restricted.

- A. <100 km² (< 1 township) (10 points)
- B. 101-1,000 km² (1-10 townships) (8 points)
- C. >1,000 km² (10 townships) up to ¼ the size of Maine (6 points)
- D. About ¼-½ the size of Maine (4 points)

- E. About $\frac{1}{2}$ - $\frac{3}{4}$ the size of Maine (2 point)
 - F. Statewide (0 points)
4. **Distribution trend** (in Maine) - % change (last 50 years) in area occupied by the taxon. (This is an estimate of change in the portion of the total area that is occupied or utilized; it may not equal the change in total range).
- A. Area occupied has declined by >50% (10 points)
 - B. Area occupied has declined by 26 - 50% (8 points)
 - C. Area occupied has declined by 5 - 25% (5 points)
 - D. Area occupied has declined by <5% (2 Points)
 - E. Area occupied is stable or has increased (0 points)
5. **Population concentration** - degree to which individuals within populations congregate or aggregate seasonally (e.g., breeding sites, migration focal points) or daily (e.g., communal roosts) at specific locations. Implies a regular temporal compression of the distribution independent of factors considered in variables 3 and 4 above.
- A. Majority concentrates at single location (10 points)
 - B. Concentrates at 1-25 locations (7 points)
 - C. Concentrates at >25 locations (3 points)
 - D. Does not concentrate (0 points)
6. **Reproductive potential for recovery** - ability of the taxon to recover from serious declines in population size.
- A. Average number of eggs or live young produced/adult female/yr.
 - a. <5 offspring/female/yr. (5 points)
 - b. 5 - 9 offspring/female/yr. (2.5 points)
 - c. >9 offspring/female/yr. (0 point)
 - B. Minimum age at which females typically first reproduce.
 - a. >8 yr. (5 points)
 - b. 4-8 yr. (3 points)
 - c. 2-3 yr. (1 point)
 - d. <2 yr. (0 points)
7. **Ecological adaptability** - degree to which the taxon is dependent upon certain environmental factors, i.e. where the bottlenecks are.
- A. Dietary adaptability - choices below relate to the primary way in which populations (a species or guild within an order or class) respond to decreases in availability of preferred food type.
 - a. Not adaptable (3.3 points)
 - b. Moderately adaptable (1.7 points)

- c. Highly adaptable (0 points)
 - B. Reproductive adaptability - choices below relate to the primary way in which local populations respond to decreases in availability of preferred breeding or young rearing sites within their habitat (e.g., tree or snag species or size class).
 - a. Not adaptable (3.3 points)
 - b. Moderately adaptable (1.7 points)
 - c. Highly adaptable (0 points)
 - C. Other forms of adaptability or sensitivity - ecological or behavioral specializations not covered in variables 7A or 7B (e.g., strict requirements for hibernacula, narrow ambient temperature limits, or specific roosting structure, sensitivity to contaminants, etc.).
 - a. Has specialized requirements or is highly sensitive (3.3 points)
 - b. No specialized requirements or is not very sensitive (0 points)
- 8. **Vulnerability to harvest**
 - A. Vulnerability to harvest *methods*
 - a. High vulnerability (5 points)
 - b. Moderate vulnerability (2.5 points)
 - c. Low vulnerability (0 points)
 - B. Vulnerability to harvest *conditions* (due to environmental factors)
 - a. High vulnerability (5 points)
 - b. Moderate vulnerability (2.5 points)
 - c. Low vulnerability (0 points)
- 9. **Predicted trends of habitat limiting to species** - now or within the next 25 years
 - A. Declining (well recognized trend) (10 points)
 - B. Likely declining; or stable, but likely to decline (8 points)
 - C. Small incremental losses annually (6 points)
 - D. Net habitat gain/loss is expected to be balanced (4 points)
 - E. Likely increasing; or stable, but likely to increase (2 points)
 - F. Increasing (well recognized trend) (0 points)
- 10. **Ecological Importance** - the degree to which a species influences (positively and negatively) the ecological community it lives in, at densities found in Maine. If this species was removed from its ecological community (e.g., wetland community):
 - A. The majority of the species in this community would be considerably influenced (10 points)
 - B. Its immediate associates (its prey, competitors, or predators) may be considerably influenced (5 points)
 - C. There would be little impact on other species (0 points)

Current Knowledge Variables and Categories Within Variables

1. **Knowledge of population distribution in Maine (survey score)**
 - A. Distribution is extrapolated from a few locations, or knowledge limited to general range maps (10 points)
 - B. Broad range limits or habitat associations are known, but township occurrence cannot be predicted accurately (5 points)
 - C. Distribution is well known and occurrence can be accurately predicted throughout the range (0 points)
2. **Knowledge of population trend in Maine (monitoring score).**
 - A. Not currently monitored (10 points)
 - B. Monitored locally or statewide monitoring inadequate to detect population trend (7 points)
 - C. Statewide monitoring adequate to detect population trend (3 points)
 - D. Statewide population estimate, or nearly complete census (0 points)
3. **Knowledge of Maine population limitations (research score)**
 - A. Factors affecting population size and distribution are unknown or unsubstantiated in the scientific literature or Departmental data (10 points)
 - B. Some factors affecting population size and distribution are known (5 points)
 - C. Most factors affecting population size and distribution are well documented (0 points)
4. **Ongoing management activities in Maine (management score)**
 - A. Status of species *assessment*
 - a. No assessment has been done for species (5 points)
 - b. An assessment has been done but is in need of revision (3 points)
 - c. A current assessment has been completed (0 points)
 - B. Status of species *management system*
 - a. Management system for species has not been completed (5 points)
 - b. Management system has major problems (4 points)
 - c. Management system has minor problems (2 points)
 - d. Management system is working well (0 points)
5. **Knowledge of statewide habitat quantification**
 - A. Habitats important to the species are not known, not measured, or cannot be measured with current technology (10 points)
 - B. Habitats important to the species have been measured at least once in the last 15 years on a statewide basis (5 points)

- C. Habitats important to the species are measured at regular intervals (at least every 5 years) on a statewide basis; or habitat is not limiting species in Maine (0 points)

Socioeconomic Variables and Categories Within Variables

1. **Public interest** - positive or negative (Social score)
 - A. Among *all* consumptive users (can be steady or pulsed interest)
 - a. Intense statewide interest in species (10 points)
 - b. Moderate statewide interest (7 points)
 - c. Low statewide interest (3 points)
 - d. Little or no public interest (0 points)
 - B. Non-consumptive users
 - a. Intense statewide interest in species (10 points)
 - b. Moderate statewide interest (7 points)
 - c. Low statewide interest (3 points)
 - d. Little or no public interest (0 points)
2. **Impact that use (consumptive and non-consumptive) of species has on the economy** (Economic score)
 - A. By Maine residents
 - a. Significant impact on Maine's economy (10 points)
 - b. Significant local or moderate statewide impact (7 points)
 - c. Local or low statewide impact (3 points)
 - d. Little or no impact (0 points)
 - B. By nonresidents
 - a. Significant impact on Maine's economy (10 points)
 - b. Significant local or moderate statewide impact (7 points)
 - c. Local or low statewide impact (3 points)
 - d. Little or no impact (0 points)
3. **Nuisance potential of species**
 - A. High potential (10 points)
 - B. Moderate potential (5 points)
 - C. Low potential (0 points)